C V Vishveshwara – A short Profile

(March 6, 1938 – January 16, 2017)

Prof Vishveshwara, always called CVV or Vishu by people known to him, passed away on January 16, 2017. A brilliant physicist known the world over for his fundamental contributions to General Relativity, Relativistic Astrophysics and Cosmology, he was great orator, writer and a visionary.

CVV is the Founding Director of J N Planetarium Bengaluru which was established by the then Bangalore City Corporation. Later, in 1992, the administration of the planetarium was handed over to an autonomous body comprising several great scientists. Prof U R Rao is the Chairman. CVV was its vice-chairman until his unfortunate demise on January 16.

Prof Vishveshwara had his schooling in National High School, Bengaluru, completed his Masters' in Physics from Mysore University and from Columbia University. His Ph. D work was on "*Stability of the Schwarzschild Metric*" under the renowned Advisor Professor C.W. Misner. Schwarzschild Metric was what we now call 'Black Holes'. And, those were the days when people did not believe in the existence of Black Holes. So, CVV would tell us in lighter vein that 'BH at that time were not a source of anything…. Not even income'. But then, for a graduate student it must have been a big challenge to take up research in a field whose existence was doubtful! After knowing CVV for more than two decades, taking up challenging assignments was his nature. He would often quote Einstein in this regard: **"I have little patience with scientists who take a board of wood, look for its thinnest part, and drill a great number of holes where drilling is easy."** During his career in research he did 'drill a few holes in the toughest part of the wood'. One of them was to show that Black Holes can form – outside the mathematical equations that described them theoretically. Another was to show that, having formed, they were stable. Until now these are convictions. CVV went on to show an important character of Black Holes – that, a 'Gaussian wave packet' would be scattered by a BH in a specific, verifiable manner. This was in a short paper that was published in the prestigious journal, Nature, in 1970. LIGO set up that directly detected gravitational waves in September 2015 showed up the signature of the scattered wave that Vishu had computed way back in 1970! LIGO

not merely detected the gravitational waves, elusive for a century from the time of its prediction, but directly observed the formation of a BH! The gravitational waves were the result of the formation of a BH. Unsurpisingly, Vishu's paper of 1970 is cited fourth in the paper related to the direct detection of gravitational waves by LIGO. Vishu's research career spread over five decades has inspired a number of students. He was one scientist of a rare kind who could convey the essence of his research in simple terms to anyone of any age. This rare gift to simplify profound ideas was not restricted to his field alone. His hundreds of talks delivered all over the country in popular forums that drew student community and subject experts alike are a testimony to his oratorical skills. His lectures at Bangalore Science Forum, started by his Guru Dr HN, always drew huge numbers. His name was a best-seller. And, he never disappointed the crowd. Without diluting the profound ideas that he would discuss – he had utter dislike to talk the routine or obvious ones- he would lace the talks with subtle humour that fitted into his talks like pieces fit into a completed jigsaw puzzle. Conveying science in a popular, that is non-mathematical and semi-technical manner came as easily as the tough problems that he cracked in research.

During his stint as the Director of the planetarium, he initiated a number of educational activities that were aimed at imparting science education by non-formal methods. Science in Action – an exhibition of working experiments was one of the first academic programmes that he conceptualized in 1992. It may surprise many that a pure theorist that he was, CVV firmly believed in doing science. He emphasized on bringing out the joy of seeing scientific phenomena to young students. That was a way to attract them to science. In fact this philosophy of 'doing' science underlined every activity that was visualized at JNP in the coming years. SEED (Science Education in Early Development) for middle school children, SOW (Science Over the Weekends) for high school children and at the pinnacle of all our educational programmes is the REAP (Research Education Advancement Programme) for undergraduate students. SEED, SOW and REAP, all have a very strong presence of experiments that make the programmes dynamic and vibrant and endearing to children. During the last twenty years, all these programmes have seen a steady growth in number of students attending them and also in attracting quality students with a potential to excel in a career in science. No wonder that more than hundred students are either pursuing PhD programmes

or have completed it. Some of them are working in prestigious institutes such as ICTS, JNCASR, CMI and so on.

Another of his immense contribution is in setting up a Science Park in the Campus of JNP. Slowly and steadily built over 15 years, it serves as a playground to learn science – you can call it an amusement park, if you like. It amuses and amaze children by showing science in a playful manner. The science park has served as a model for several educational institutions and science centres to replicate. CVV had a great sense of art, culture, music and fine art. The planetarium programme scripts that he prepared for several shows brought out his taste for these factors that appealed to the discerning audience. It is not a hollow claim that our planetarium shows have a distinct character on account of this and it's a hard legacy to follow. We are sure that many would have been drawn to pursue astronomy or astrophysics under the spell cast by such shows.

As an ardent science popularize, he wrote several articles, edited books and authored two extraordinarily written books – 'Einstein's Enigma or Bubble in my Bathtub' and 'Universe Unveiled'. One has to just read these to get a glimpse of the man with myriad interests. And, his interests were not superficial. He could speak with equal felicity about Vedas or music or Mozart as he did about Black Holes or Relativity. The many dimensions to his personality bears strong resemblance to the number of dimensions of Spacetime that he so lovingly studied during his lifetime. Here, one of the recent students, Suraj S Hegde, pursuing PhD at University of Illinois, Urbana-Champaign, has this to say about CVV on his Facebook Page and this could well be the opinion shared by all the students of CVV:

"I am extremely lucky to have been under his guidance and he has shaped my thinking in physics and as a person in general. He strongly urged, encouraged and helped me to pursue grad school abroad when I was in a hopeless state of having a useless engineering degree from some worthless college and with no formal physics education. I owe my physics career to him and would like to dedicate my graduate school contributions and thesis to him….. Interactions with him used to last for hours discussing topics ranging from physics, literature, culture and films. People who have met him know about his inimitable sharp wit and humor. I would say his cartoons are equally a great contribution as his physics."

His passing away has robbed of a jewel leaving the scientific world, in particular, and the knowledge world in general, poorer.